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son's Bay, the Mississippi valley, and the Salt-Lake and Nevada basins commenced to sink very early, and the future growth of the continent consisted largely in filling them up with marine sediments. An inspection of a map drawn upon a correct scale will dissipate the fancied resemblance to the letter V, in the Canadian dominion, so often insisted upon. Neither has the development of the land been in bands parallel to the north-west and south-east arms of this supposed angle. A better conception would find three great basins, excluding the unknown regions of Mexico and Alaska, in each of which operations were conducted independently. The best known is that of the interior of the United States, or the Mississippi hydrographic basin. This depression was nearly encircled by a crystalline border of high land. Beginning at Alabama, we follow it to New England, thence by a slight gap to the Adirondack promontory, thence across the Lakes to the Dakota promontory. In Minnesota and Dakota the schists are more or less covered by cretaceous clays and tertiary sands; but they evidently constitute the floor for the surface strata occasionally piercing through the later deposit, as in the Black Hills. Thus we may connect the Dakota and Rocky Mountain crystallines. From Wyoming southerly the granites are again conspicuous into New Mexico. Thus the circuit is not complete: it is like a horseshoe, with the lower Mississippi valley in the gap; yet this may have been filled in the Cambrian age, since Laurentian islands are found in Texas, Arkansas, and Missouri. We might give reasons for believing in the recent origin of the depression between New Mexico and Alabama.

The map will show, around the borders of this Mediterranean Sea, the primordial sea-beach, whether examined in Virginia, New York, Michigan, Colorado, or Texas. Could we dissect the land, we should find an immense platter of Cambrian sediments co-extensive with the crystalline highlands surrounding and underlying it. In Cambro-Silurian times the story is repeated. Marine limestones formed other dishes, each limited in size by the upturned edges of the platter underneath. The rest of the history is given in our text-books. Our Mediterranean Sea was not closed till the end of the cretaceous, when the salt-water was expelled, never to return.

In the west a similar ovoidal, crystalline border can be traced, holding paleozoic sediments. Beginning at the Rocky Mountain chain in Wyoming, we follow it southerly to Mexico. Across Arizona are many gneissic outlines, but not sufficiently numerous to close the gap. In California we reach a country entirely gneissic beneath the sands of the desert, which connects with the Sierra Nevadas, and is traceable along the Nevada line nearly to Oregon. There the course is changed, the rocks trend north-easterly, show themselves conspicuously in the Blue Mountains of eastern Oregon, the Salmon River Mountains of Idaho, and western spurs of the Rockies again in Montana, which are continuous to our starting-point in Wyoming. Our crystallines do not pass north of the parallel of 49° into Columbia. We have

therefore found a complete crystalline border for the depressions of our western territories, and, within this ovoidal line, all the members of the paleozoic, mesozoic, and cenozoic groups, but not arranged with the simplicity of their distribution in the east.

Less is known of the arctic basin than of the others; but the scattered sketches afforded by voyagers indicate the presence of the more important members of the geological column. Where these basins adjoin, there is a much wider area of ancient land.

In conclusion, I will simply recapitulate the more important phases of the growth of our continent.

We start with the earth in the condition of igneous fluidity.

It cools so as to become incrustated and covered by an ocean.

Numerous volcanoes discharge melted rock, building up ovoidal piles of granite, which change gradually into crystalline schists. When these hills are high enough to overlook the water, they constitute the beginnings of dry land.

At the commencement of paleozoic time the continent is composed of three immense basins, located near Hudson's Bay, the Mississippi hydrographic area, and the great Nevada series of land-locked valleys.

The later history of the development of the continent presents the details of the filling-up of these depressions, the expulsion of the Mediterranean seas, and the description of the varied forms of life that successively peopled the land and water.

The history opens with igneous agency in the ascendant. Aqueous and organic forces became conspicuous later on, and ice has put on the finishing touches to the terrestrial contours. The completed structure we must acknowledge to be 'very good.'

NOTES AND NEWS.

Our leading article of June 29 was based in part upon a mistake, which we desire to correct. Foreign periodicals received by mail in single numbers have not been dutiable within the last five years. Nevertheless, the writer of the article, who subscribes to three foreign scientific journals, and receives them by mail, had been forced to pay duty on each number for the past nine or ten months; and the same has been the case with others of our acquaintance. Our post-office regulations are so frequently changed that one can rarely tell whether he is the victim of a blunder or a whim.

—M. Pasteur, who has just obtained a grant of fifty thousand francs from the French Chambers to send a scientific mission to Egypt to investigate whether the cholera be not due to the development of a microscopic animal in the human body, states, in a letter to *Voltaire*, the reasons which induced him to recommend the board of health to send out the mission in question. He says, "I urged the sending-out of this mission on account of the great progress that science has made since the last cholera epidemic respecting transmissible diseases. Every one of those

diseases that have been the subject of a thorough investigation has led biologists to the conclusion that they were caused by the development, in the body of man or the animals, of a microscopic animal, causing therein disturbances frequently fatal. All the symptoms of the disease, all the causes of death, are directly under the influence of the physiological properties of the microbes. What is needed at present to meet the requirements of science, is to ascertain the primary cause of the scourge. Now, the present state of our knowledge indicates that we should direct all our attention to the possible existence in the blood, or in such or such an organ, of an infinitesimally small being whose nature and properties would in all likelihood account for all the peculiarities of cholera, both as regards its morbid symptoms and the mode of its propagation. The existence of that microbe once ascertained would speedily settle the question as to the measures to be taken to check the spread of the disease, and might possibly suggest new therapeutic means to cure it." The mission consists of four young *savants*, doctors, and biologists, — Drs. Roux, Thuillier, Straus, and Nocard. M. Pasteur hopes, that, by scrupulously attending to the hygienic precautions he has written down for them, the great danger they are incurring may be minimized.

—The September *Century* has several papers to which our readers' attention may be called. One of the illustrated articles relates Lieut. Schwatka's personal adventures in the hunt for the musk-ox. Ernest Ingersoll gives an excellent account of Mr. Agassiz' private laboratory at Newport, and of the methods he has so successfully introduced for carrying delicate sea-animals through their earlier stages. An admirable portrait, engraved by Velten, from a photograph of Notman's, will interest many. It has more spirit than one formerly published in the *Harvard register*. Under the title, 'The tragedies of the nests,' John Burroughs writes of the difficulties birds encounter in rearing their young. The attempts toward the unification in railway time in this country are briefly discussed by W. F. Allen.

A writer on ornamental forms in nature gives several striking illustrations of the effects producible, with due study, by 'the naturalistic school' of decorators. With eyes capable of seeing the stream, moth, vine, and skunk-cabbage 'in nature' as they appear to our writer, we may doubt the possibility of their evolutionary limit in art being ever reached. Like the Spanish-Moorish designer, he 'evidently did not care three straws for what all the botanists and florists on earth might think of his work,' so long as it teach us to regard nature from the standpoint of art, and tend in some measure to straighten the devious paths of the modern conventionalizer.

—The *Tribune* of Minneapolis, for Aug. 16, printed Dr. Dawson's address before the American association in full, as well as long abstracts of several of the sectional addresses. Subsequent issues gave very fair reports of the papers read.

—The first number of Kobelt's *Iconographie der schalentragenden europäischen Meeres conchylien* has

appeared. It is in quarto, with colored plates, and this number is devoted to species of Muricidae. The descriptions are in Latin, with German text.

—The Washington, of the Italian navy, under command of Capt. Magnaghi, is engaged in its annual cruise for the study of the western Mediterranean.

—One of the Akkas (African pygmies) taken to Italy in 1873 by Miani has just died of consumption at Verona.

—The newspapers of yesterday announce that Mr. J. A. Ryder has succeeded in rearing the American oyster from the egg. His experiments were made in natural enclosures, and so conducted as to preclude any doubt that the spat obtained has been derived from any source except that of the spawn artificially fertilized and introduced into the enclosure. The greatest obstacle to the cultivation of the oyster is now removed.

RECENT BOOKS AND PAMPHLETS.

Delogne, C. H. Flore cryptogamique de la Belgique. livr. 1. : mousses. Bruxelles, 1883. 8°.

Delpino, F. Teoria generale della fillostasi. Genova, 1883. 345 p. 4°.

Depérais, C. Hygiène publique: nouveau traitement des cadavres ayant pour but la destruction des germes contagieux qu'ils peuvent contenir. Naples, *Inst. roy. d'encouragement*, 1883. 19 p., pl. *autogr.* 8°.

Drinker's Explosive compounds and rock drills. Forming a supplementary volume to the first edition of Drinker's Tunneling. N.Y., 1883. 4°.

Duclaux, Microbiologie. Paris, 1883. 908 p., 111 fig. 8°.

Gerland, E. Der leere raum, die constitution der körper und der aether. Berlin, 1883. 8°.

Grindon, L. H. The Shakspeare flora. Guide to all the principal passages in which mention is made of trees, plants, flowers, and vegetable productions. With comments and botanical particulars. Manchester, 1883. 330 p. 8°.

Henrievaux, J. Le verre et le cristal. Paris, 1883. atlas, 26 pl. 8°.

Heriz, E. Construcción de mapas. Barcelona, *Ramirez*, 1882. 12 p., 8 pl. 4°.

Herrmann, G. Der reibungswinkel. Aachen, 1883. fig. 4°.

Heukels, H. Schoolflora van Nederland. Bewerkt naar O. Wiinsche's Schulfloora von Deutschland. Groningen, 1883. 624 p. 8°.

Israels, A. H., en Daniëls, C. E. De verdiensten der hollandsche geleerden ten opzichte van Harvey's leer van den bloedsomloop. Utrecht, 1883. 143 p. 8°.

Jordan, D. S., and Gilbert, C. H. Synopsis of the fishes of North America. Washington, 1883. 1,018 p. 8°.

Jordan, W. L. New principles of natural philosophy. London, 1883. illustr. 8°.

Koehler, R. Recherches sur les échinides des côtes de Provence. Marseille, 1883. 167 p., 7 pl. 4°.

Kohlfürst, L. Die elektrischen einrichtungen der eisenbahnen und das signalwesen. Wien, 1883. (elektro-techn. bibl., xli.) 288 p., illustr. 8°.

Lambert, E. Traité pratique de botanique. Propriétés des plantes, leur utilité et leur emploi dans la médecine, l'industrie, etc. Paris, 1883. illustr. 8°.

Larden, W. School course on heat. N.Y., 1883. 321 p., illustr. 8°.

List of British birds. Compiled by a committee of the British ornithologists' union. London, 1883. 258 p. 8°.

Lubbock, J. Fourmis, abeilles et guêpes. Études expérimentales sur l'organisation et les mœurs des insectes hyménoptères. 2 vols. Paris, 1883. illustr. 8°.

Mann, L. Die atomgestalt der chemischen grundstoffe. Berlin, 1883. illustr. 8°.

Martini, A. Manuale di metrologia, ossia misure, pesi e monete in uso attualmente e anticamente presso tutti i popoli. Torino, 1883. 912 p. 8°.